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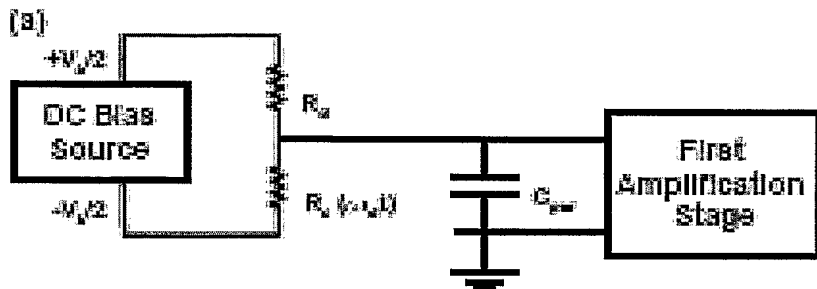
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(54) Title: DETECTION OF RESONATOR MOTION USING PIEZORESISTIVE SIGNAL DOWNMIXING



(57) Abstract: A system containing a micro-mechanical or nano-mechanical device and a method of operating the same is provided. The device includes a resonator and a piezoresistive element connected to the resonator. The method includes AC biasing the piezoresistive element at a first frequency, driving the resonator at a second frequency different from the first frequency, and detecting a mechanical response of the resonator

at one or both of a difference frequency and a sum frequency of the first and second frequencies.